



ZOOM™ Geode™ Development Kit

Geode™ NX QuickStart Guide

REVISION HISTORY

REV	EDITOR	REVISION DESCRIPTION	APPROVAL	DATE
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1 Introduction

Congratulations on your purchase of the Zoom™ Geode™ NX DB1500 development kit with SiS chipset. The NX DB1500 provides a product-ready software and hardware platform for evaluating the functionality of AMD Geode NX processors (i.e., AMD Geode NX 1750@14W processor, AMD Geode NX 1500@6W processor, and AMD Geode NX 1250@6W processor*). This results in an embedded product development cycle with less time, less cost, less risk... more innovation.

1.1 Development Board Features

Hardware Features

- AMD Geode NX Processor
 - 462-pin Socket A Pin Grid Array package with ZIFF socket
 - DDR266 Front Side Bus
 - AMD PowerNow!™ technology support
 - Fanless heatsink
- SiS741CX Northbridge
 - Support for 462-pin Socket A Geode NX processors (Note: Processor power supply will only support up to 25W max processors.)
 - Support for Front Side Bus speeds up to DDR333
 - Integrated graphics controller
 - High performance 3D engine
 - High performance 2D accelerator
 - MPEG-2/1 video decoder
 - Analog graphics mode support up to 2048x1536x24 bpp at 75 Hz NI
 - TTL level TFT LCD display header for display support up to 1600x1200x32 bpp@60 Hz NI (LVDS display support requires LVDS adapter board)
 - High performance 266/333 DDR memory bus
 - Support for Industry standard PC2100/PC2700 DDR DIMMs up to 1 GB
 - High bandwidth (1 GByte/s) MuTIOL Southbridge bus
- SiS964 Southbridge
 - High bandwidth (1 GByte/s) MuTIOL Northbridge bus
 - IDE Controller
 - One IDE channel with support for two Ultra DMA-133 devices
 - SATA 1.0 Controller
 - Supports two Ultra DMA 150 drives
 - RAID 0/1 support (pending BIOS support)
 - USB Host Controller
 - Support for six USB 2.0 high speed (480 Mbit) host connections: two ports available through back panel connectors and four ports available through on-board headers
 - Supports wake-up on USB event
 - Fast Ethernet MAC Controller (SiS900 compatible)
 - Full duplex 10base-T, 100base-TX
 - Supports "Wake on LAN"
 - Realtek RTL8201CL PHY
 - AC97 Audio Controller Interface (SiS7012 compatible)
 - AC97 v2.3 compliance
 - Realtek ALC203 2-channel audio codec
 - Mic In
 - Line In
 - Head Phone Out
 - SPDIF Out
 - Optional Wolfson WM9712 audio codec (population option): 2-channel audio, 4-wire resistive touch panel support (contact Logic PD for details)

*The AMD Geode™ NX 1750@14W processor operates at 1.4 GHz, the AMD Geode™ NX1500@6W processor operates at 1.0 GHz, and the AMD Geode™ NX 1250@6W processor operates at 667 MHz. Model numbers reflect performance as described here:
<http://www.amd.com/connectivitysolutions/geodenxbenchmark>.

- ☐ Power Management support
 - ACPI 2.0
 - Support for S1, S3, S4, and S5 Sleep states
- ☐ PS/2 Keyboard/Mouse support
 - Supports Wake on event
- Winbond W83627 Super I/O Controller
 - ☐ Parallel port
 - ☐ Two serial ports (1 via DB9 connector, 1 via header)
 - ☐ System/CPU temperature/voltage monitor

Software

- BIOS from AMI and Award
- Support for Windows® XP/XPe
- Linux board support packages (BSPs) available

Mechanical

- Mini-ITX SBC, 6.7" (170mm) long x 6.7" (170mm) wide x 1.3" (33mm) high

2 Getting Started

2.1 Unpacking the System

The NX DB1500 incorporates a Geode NX processor and SiS chipset in a Mini-ITX SBC (Single Board Computer) form factor. The board is populated with one DDR (DIMM) memory module. The development kit includes the board, heatsink, development tools, software, and support documentation. Refer to the kit contents (or packaging list) shipped with the kit for a complete content description.

Once you have verified that all the items are present, remove the board from its protective jacket and anti-static bag. Check the board for any visible damage and ensure that there are no broken, damaged, or missing parts or connectors.

Note: Avoid touching the MOS devices. Static discharge can and will damage these devices.

Note: Northbridge heatsink is bonded to chip using a thermal transfer pad. Do not attempt removal.

2.2 Required Equipment

- ATX compatible power supply with power cord (ATX supply rated below 300W. Larger supplies may be underloaded.)
- Hard disk drive and CD-ROM or DVD-ROM drive
- PS/2 or USB keyboard and mouse
- VGA monitor
- Optional Zoom Display Kits (see Section 7 at end of this QuickStart Guide)

2.3 Development PC Requirements

The Geode NX DB1500 development kit is a fully functional SBC. However, a workstation is necessary for Windows XP/XP Embedded development.

For minimum system requirements for Windows XP/XPe, see:

<http://msdn.microsoft.com/embedded/getstart/prodoverview/sysreq/ce/default.aspx>.

2.4 Connection Diagram

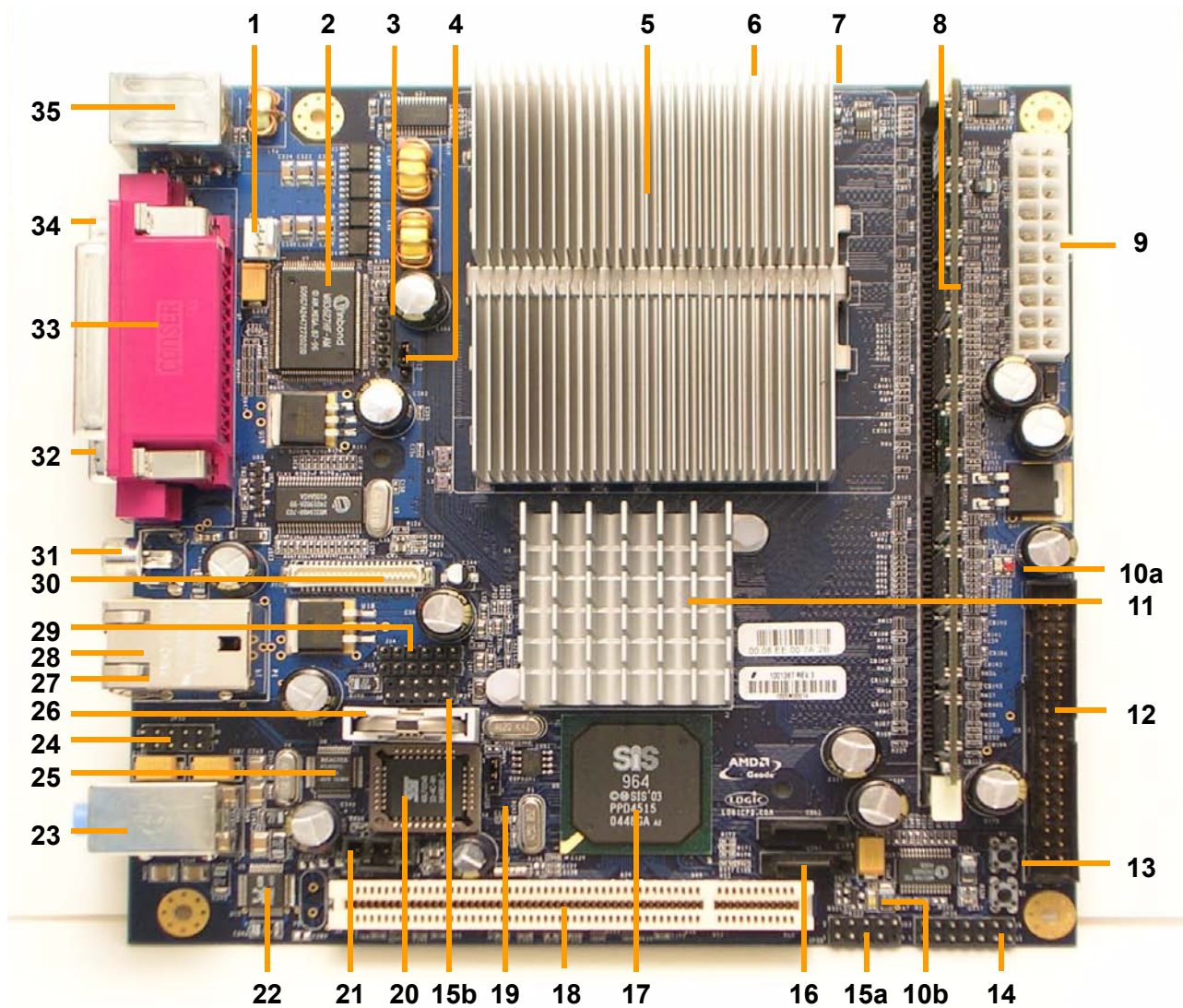


Figure 2.1 – Connection Diagram

Item Number	Description
1	CPU fan connector
2	Super I/O
3	IR header
4	LCD panel logic voltage select (5V/3.3V)
5	Processor heatsink
6	CPU socket, Socket 462 (underneath heatsink)
7	Hardware Debug Tool Connector (underneath board)
8	DDR DIMM slot
9	ATX power connector

Item Number	Description
10	a. ATX power LED; b. Hard drive LED
11	SiS741CX Northbridge and heatsink
12	IDE connector
13	Reset switch bottom, soft power-on top
14	ATX front panel header
15	a. & b. USB 2.0 header (2)
16	Serial ATA connectors (2)
17	SiS964 Southbridge
18	PCI slot
19	Clear CMOS jumper
20	BIOS Flash memory
21	CD IN connector
22	Audio codec
23	Audio ports (3) (Note 1)
24	Serial port header (COM2) (Note 1)
25	Ethernet LAN PHY
26	Battery
27	RJ45 port (top)
28	USB 2.0 ports (2, bottom)
29	Backlight header and touch screen header
30	TFT panel connector (Note 2)
31	S/PDIF digital audio out port
32	VGA port (below parallel port)
33	Parallel port
34	Serial port (below parallel port)
35	PS/2 keyboard and mouse port

Note 1. The serial port header and the audio ports switch positions in revision 2 boards and later.

Note 2. Requires a separate, external module board to properly shift LCD signal levels. Please see Logic Product Development's Application Note 306: *LCD Level Shifting on Geode NX DB1500 SBC* available for download at <http://www.logicpd.com>.

3 QuickStart

3.1 Setup Procedure

Mount the development board in a PC chassis or place it on a non-conductive surface.

The CPU, heatsink, and SDRAM memory module should already be installed. DO NOT remove the heatsink from the CPU. In the event that the heatsink is removed from the CPU, follow the steps outlined in *Zoom Geode NX Development Kit User's Manual* to install the heatsink.

Note: The Geode NX 1500@6W and NX 1250@6W processors do NOT require a fan for the heatsink. The Geode NX 1750@14W processor does require a heatsink fan.

3.2 Jumper Configurations

Verify that the CMOS clock has the appropriate jumper (see Figure 2.1 "Connection Diagram" on page 7, item 19). The CMOS jumper is used to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. Use the following procedure to clear the CMOS contents.

- A) Turn off the power supply and unplug the power cord.
- B) Use the jumper cap to short pins 1 and 2 for three seconds, as shown in Figure 3.1.
- C) Place the jumper cap back on pins 2 and 3.
- D) Plug in the power cord and turn on the power supply.

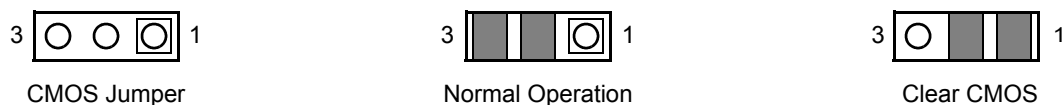


Figure 3.1 – CMOS Jumper

3.3 Connecting Peripherals

- 1) Connect the hard disk drive and CD-ROM (or DVD-ROM) drive using an 80-conductor IDE cable. The cables are polarized to prevent improper insertion. Configure the hard disk drive as the master device and the CD-ROM (or DVD-ROM) as the slave device.
- 2) Make sure that the switch on the ATX power supply is in the OFF position before connecting a power cable from the ATX power supply to each of the drives.
- 3) Install any desired PCI devices into the available slot on the development board.
- 4) Connect a keyboard and mouse to the appropriate connectors on the I/O backplane of the development board.
- 5) Connect a VGA compatible monitor to the VGA connector on the I/O backplane of the development board.

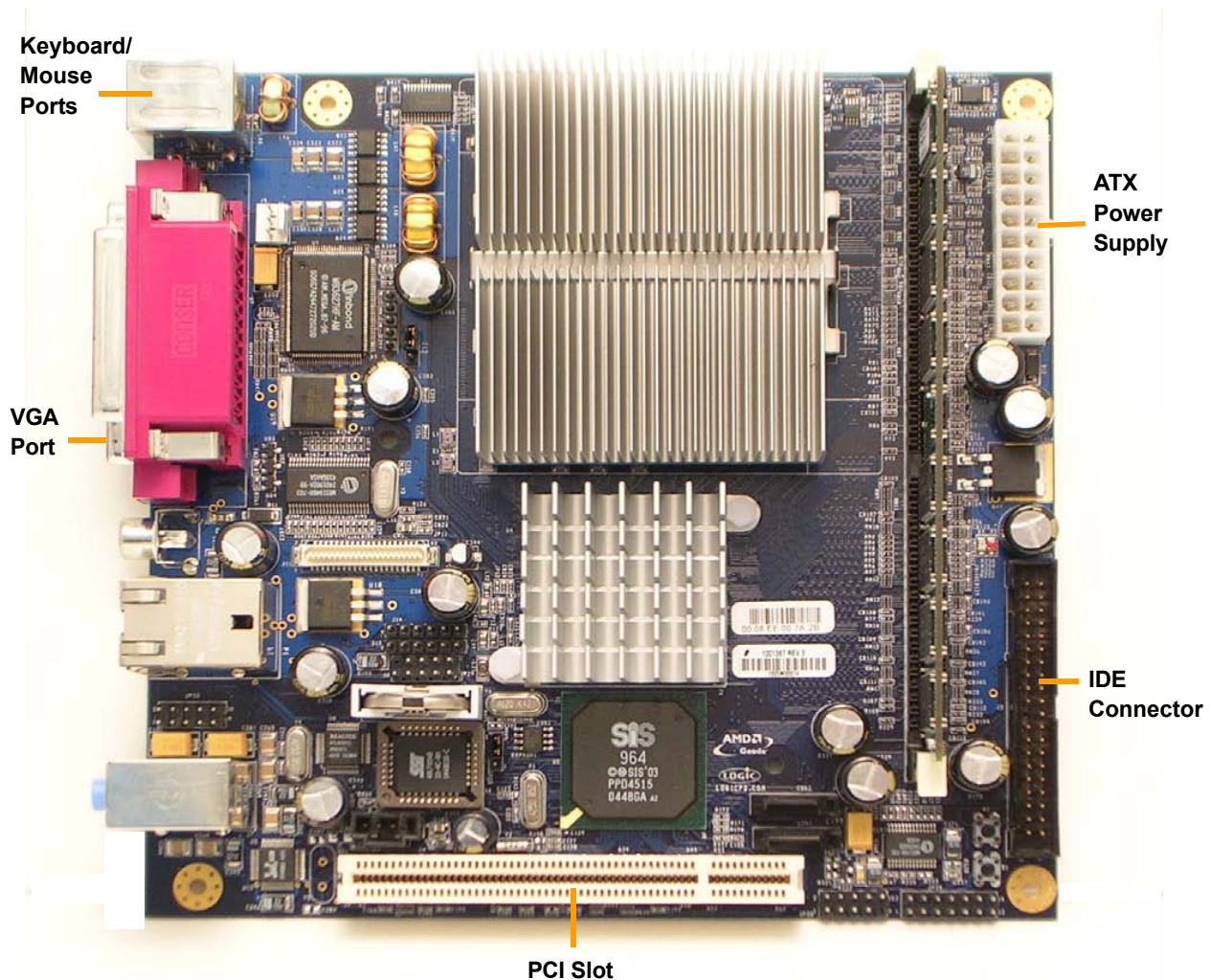


Figure 3.2 – Peripheral Connections

4 Test Run

4.1 Power-up the Board

- 1) Plug the power cord for the monitor into an electrical outlet and turn its power switch ON.
- 2) Make sure that the switch on the ATX power supply is in the OFF position and connect the ATX power supply to the development board ATX power connector.
- 3) Connect the AC power cord for the ATX power supply to the rear of the supply. Plug the other end of the cord into an electrical outlet and flip the switch on the ATX power supply to the ON position. The red LED (LED1) on the development board should light up, indicating that Standby power is present. Press the power switch (SW3). The green LED should light up.

4.2 Configure the System for OS Installation

Note: The BIOS shipped with the kit is by AMI. The following steps will vary for non AMI BIOS.

- 1) Once the system is powered on, video appears and the system executes the Power On Self Test (POST) and begins detecting installed drives. During this time, press "Delete" on the keyboard to enter the BIOS setup program.
- 2) Navigate to the "Boot" menu tab and then select "Boot Device Priority". Set the desired boot order to:
 - CDROM/DVD (first boot device)
 - Hard Drive (second boot device)
- 3) Save changes to BIOS by selecting "Save" and "Exit setup" in the main menu or by pressing the <F10> key. Select "Yes" to confirm and the system will restart.
- 4) At this point, the system has been properly configured and the OS may be installed.

4.3 Self Test

Read through the following steps before beginning the procedure.

- 1) With the system powered on, insert the boot media provided with your software (CD-ROM or DVD-ROM) into the appropriate drive.
- 2) Press the reset switch (SW2). The system will reset and run the POST.

When the system has completed POST, it scans the drives for bootable media in the order defined in the BIOS setup program.

Note: If using a hard disk that already contains a bootable image and a bootable CD-ROM is inserted, the system will prompt you to "Press any key to boot from CD." You have three seconds to press any key if you wish to boot from the CD-ROM. Otherwise, the system will boot from the image on the hard disk.

- 3) Once the system detects the bootable media, it begins executing it. A setup program for the OS should start. Follow the instructions provided with your OS manual.

Now that you have completed your test run, please proceed to the *Zoom Geode NX Development Kit User's Manual*. The User's Manual includes instructions for development board installation and BIOS information.

5 Product Notes

The Zoom Geode NX DB1500 development kit is intended for engineering development or evaluation purposes only. As such, the goods being provided may not be complete in terms of required design, marketing, and/or manufacturing related protective considerations, including product safety measures typically found in the end product incorporating the goods. The user assumes all responsibility and liability for proper and safe handling of the development kit.

ESD

Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge (ESD). The various debug header pins are tied to actual lines on the development board. Some of them will reset the board if they are touched directly. Be aware of this situation.

Approvals

This product is compliant with emissions standard EN55022 level A, and may be operated in industrial areas as defined by national regulations. This product may require a special permit for operation at other locations. Cases of interference at such locations need to be handled according to the requirements of the national EMC legislation.

6 Product Registration

In order to access the latest revision of this manual, product change notifications, application notes, schematics, and hardware specifications, please register your product online using a recent version of Internet Explorer or Netscape.

In addition, you will be notified when Logic releases updates to your product.

Go to the Log In section on the Logic website at <http://www.logicpd.com/support/>, and create a user account. You will receive an e-mail with your new username and password and additional instructions. At this point, log in and complete the product registration form to gain access to product download files.

AMD also provides additional product information and software downloadables on their Developer's site. Create an account at <http://developer.amd.com/> to gain access to their product information.

7 Zoom Display Kits

Important Notice: Use of Logic's Zoom Display Kits with the Geode NX DB1500 Development Kit requires custom cables and a separate, external module board to properly shift LCD signal levels. Please see Logic Product Development's Application Note 306: *LCD Level Shifting on Geode NX DB1500 SBC* available for download at <https://www.logicpd.com/auth/login.php>.

Display Kits are ideal for embedded solutions requiring a graphical user interface. Logic offers a variety of display sizes (e.g., 3.6", 6.4", 12.1"), resolutions (QVGA, VGA, SVGA), and types (TFT, etc.). Zoom Display Kits are sold separately. Please verify the selected development board/processor supports the Display Kits. Contact Logic for other display requirements. Visit Logic's web site at <http://www.logicpd.com> for a complete listing of Display Kits.

7.1 Zoom Display Kits Specification Table

Logic offers the following Display Kits for use with the Application Development Kits. Visit our website for current information on Zoom Display Kits

Figure 7.1 – Zoom Display Kits Specification Table

Logic model number	Mfg	Mfg P/N	Display size diagonal	Display format	LCD interface type	Key features
LCD-3.6-QVGA-10	Sharp	LQ036Q1DA01	3.6 inch	QVGA (320 x 240)	TFT	Color, transmissive w/ HRTFT ASIC
LCD-5.7-QVGA-10	Sharp	LQ057Q3DC02	5.7 inch	QVGA (320 x 240)	TFT	Color, transmissive
LCD-6.4-VGA-10	Sharp	LQ64D343	6.4 inch	VGA (640 x 480)	TFT	Color, transmissive
LCD-10.4-VGA-10	Sharp	LQ10D368	10.4 inch	VGA (640 x 480)	TFT	Color, transmissive
LCD-12.1-SVGA-10	Sharp	LQ121S1DG41	12.1 inch	SVGA (800 x 600)	TFT	Color, transmissive

Important Notice: Please verify the selected processor supports the display kits.

Please contact Logic with other display requirements.

8 Support

The Zoom Geode NX DB1500 development kit is a low cost development kit. Logic has created a self-service (FAQ, Technical Discussion Groups, Ask A Question) technical support process to make it easier for our customers to find answers to their questions, which enables Logic to provide low cost development kits. For additional technical support, please see support packages below.

What support comes with the Zoom Geode Development Kit?

- Unlimited access to our technical discussion group and FAQs available at <http://www.logicpd.com/support/>.
- One incident up to one hour of engineering support via e-mail (Ask A Question) at <http://www.logicpd.com/support/>.

What is supported in the Geode Development Kit?

- Zoom Geode Development Kit hardware
- Operating System BSPs developed by AMD or Logic Product Development
- BIOS customization

Additional Support Services Available for Purchase

- Support Packages for Dedicated Technical Support
 - Visit <http://www.logicpd.com/support/> for complete descriptions, price, and purchase.
 - Gold Support Package
 - Silver Support Package
 - Bronze Support Package
 - Hotline Incident
- Product Development Services
 - Logic offers product development and manufacturing services from initial product concept and design to volume production and fulfillment.
 - Industrial Design
 - Mechanical Engineering
 - Electrical Engineering
 - Systems & Software Engineering
 - PCB Design & Layout
 - FPGA/DSP Design
 - Manufacturing Services

8.1 Frequently Asked Questions

Visit <http://www.logicpd.com/support/> for a complete list of FAQs for the Zoom Geode Development Kit.

8.2 Technical Discussion Group

Visit <http://www.logicpd.com/support/> to join our technical discussion group and share valuable information with other designers.



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